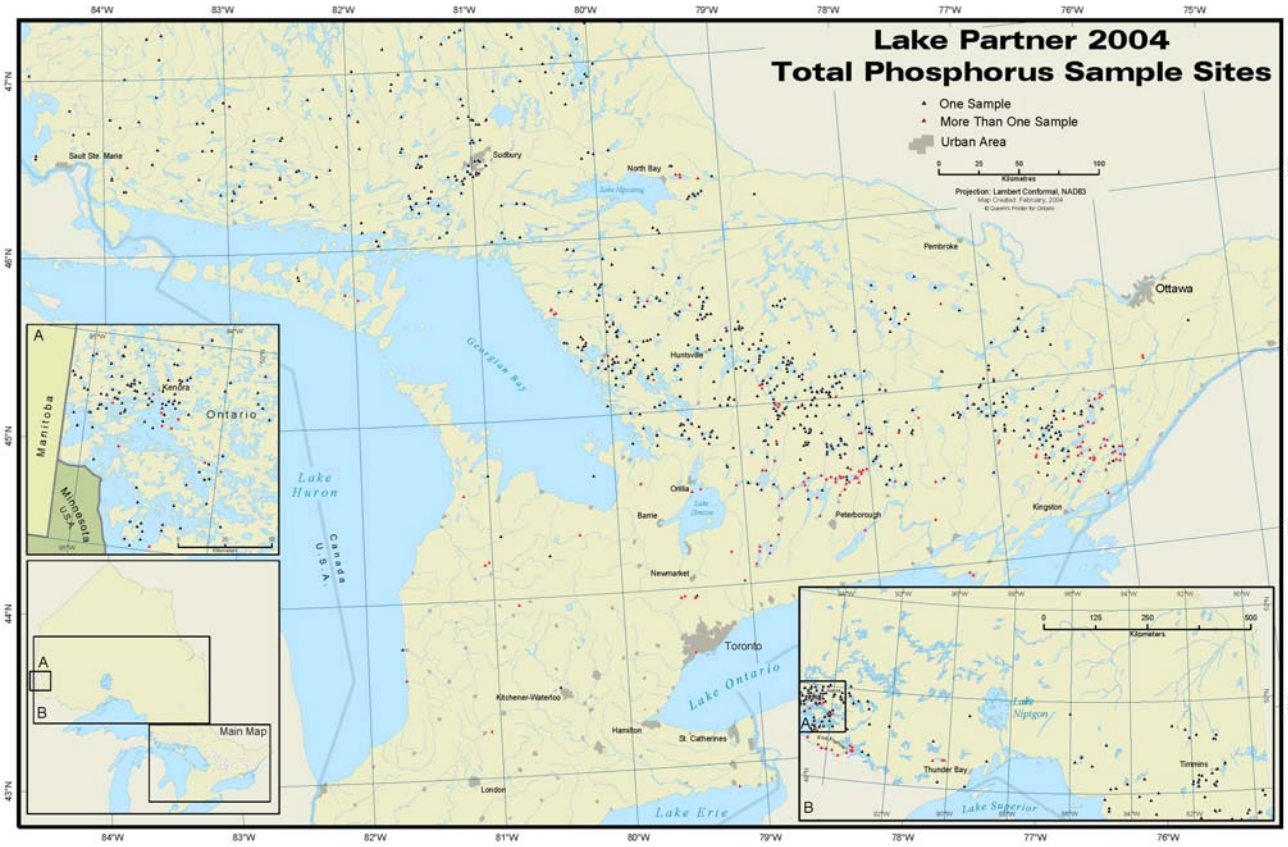
Lake Partner Program – 2004 Report

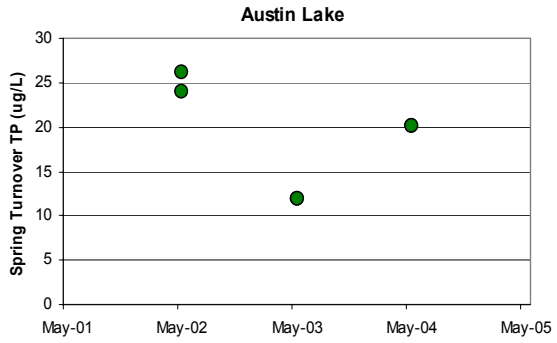
Phosphorus and Secchi results

Lake Partner Program volunteers collected water samples and made water clarity observations at 1253 locations throughout Ontario in 2004 (see map below). Volunteers will find the 2002 to 2004 total phosphorus (TP) sample results in the **2004 Total Phosphorus** Table. TP results for stations that were sampled prior to 2002 are shown as *annual means* for each station in the **Pre 2002 Total Phosphorus Annual Means** Table. These data are not as precise as the data collected since 2002 and, although the means of all years can be used to describe the average concentrations prior to 2002, they should not be used to observe trends through time. The mean annual Secchi depths observed for all stations since 1995 are shown in the **2004 Secchi Depths** Table**.** For help with the interpretation of these results please refer to the **Interpretation of TP and Secchi Results** report.

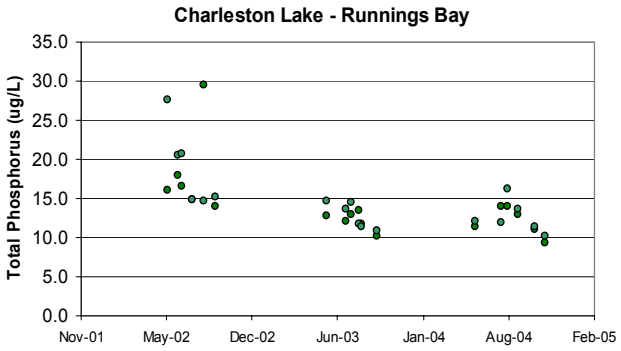


For the third consecutive year, TP samples were analysed at the Ministry of the Environment, Dorset Environmental Science Centre laboratory. We now have three years of precise, low-level TP data for a large number of lakes throughout Ontario that can be used to establish a reliable, average TP concentration for each lake. These valuable data can be used as input to computer models that can predict lake trout habitat in lakes, or to assess the output of the Lakeshore Capacity Model that predicts the present and historical TP concentrations of lakes. The data may also be used to track future changes in the TP concentrations of lakes across Ontario.

In most cases, the three years of data show small between-year differences in spring turnover TP concentrations. Within this database there does not seem to be a pattern towards increasing or decreasing concentrations over time. Considering a lakes' lifetime of thousands of years, three years is a relatively short period of time to examine trends, and new patterns may emerge in future years. Also, some lakes may show larger between year differences than others due to variations in flushing rates, or the magnitude of point and diffuse sources of TP to the lake. There are some lakes that show relatively large between-year differences (see Austin Lake). In some of these cases the TP increases, while in others it may decrease or the concentrations in the middle years may be higher or lower. It is unclear, at this point, what is causing these differences. Lake Partner data will be used to study these processes in detail as more years of data are collected.

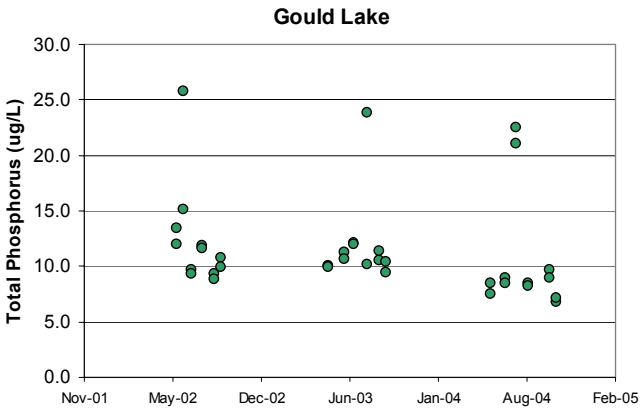


For lakes that are off the Canadian Shield (i. e. where monthly samples were collected), strong seasonal patterns were observed in many cases. This is expected and, in fact, this is the reason why we sample monthly for these lakes. Generally, we see seasonal TP ranges that are becoming less scattered after 2002 when we began to filter the Lake Partner samples to remove large zooplankton. There also seems to be a general trend towards lower TP over the three-year period for off-shield lakes (see Charleston Lake). Again, it is important to note that we are barely in a position to comment on the normal, expected, between-year variance for TP concentrations in these lakes. More data are required to detect long-term trends or patterns in these data.



Throughout the database many volunteers will notice TP concentrations that seem out of place when compared to the rest of the data. These data are unedited and we have excluded or edited data only in those rare cases where we suspect that the sample results have been wrongly attributed to the lake. In the Gould lake example (below) it is clear that there are individual tests that do not

seem to fit the rest of the data. In this case it is probable that the lake itself is contributing some form of contamination to these samples. It may be that individual zooplankters are remaining in the sample tubes when the tubes are pre-rinsed with unfiltered surface water. Whatever the case may be, it is not much of an issue because we have good data to describe the TP concentrations both seasonally and between years for Gould Lake. As we collect more years of data these "outliers" become less able to impact our interpretation of the data.



Every lake will have a story to tell based on the three years of precise data. Interpretation of the results should occur on a lake-by-lake basis considering the effects of sample date, lake location, lake type and whether or not the lake has been invaded by zebra mussels, etc. Once again we wish to thank the volunteers for their assistance in the collection of these invaluable data. It would not be possible to collect this excellent data set without your help.